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(54) **System and method of constructing a photo album**

(57) A method of constructing a photo album wherein a plurality of digital images are provided in a low resolution format as either thumbnail index sketches or sticker sheets that have a unique identifier that cross references the reduced resolution images digital images with a high resolution version that is stored in a data base. The thumbnail index sketches have a selection mechanism that allows the creation of photo albums by cross referencing the high resolution images that are stored in the data base. The embodiment that employs stickers has various mechanisms for creating the pages of a photo album including a second set of sticker sheets that function as pages of a photoalbum having positions for the low resolution image stickers. The sticker sheet pages can also be stickers themselves allowing for creation of photo albums by arranging the stickers pages are loaded with low resolution stickers creating the pages for the photoalbum and the sticker sheet pages are then arranged in a desired manner on a page layout form resulting in a miniature version of the photoalbum which can be viewed at that point. The miniature version of the photo album is then correlated to the high resolution version of the images stored in the database to retrieve a high resolution version of the photo album which is then produced using conventional photofinishing techniques.

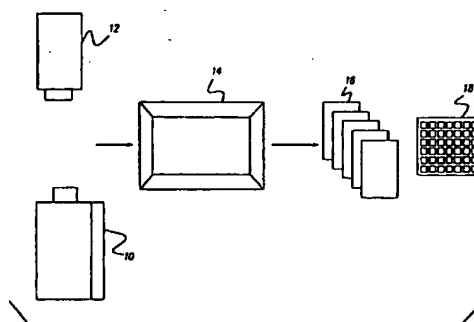


FIG. 1

## Descripti n

### FIELD OF THE INVENTION

[0001] The invention relates generally to the field of photography, and in particular to photo collections. More specifically, the invention relates to a method of generating a photo album using reduced resolution versions of images.

### BACKGROUND OF THE INVENTION

[0002] Photographs, videos, and memorabilia collections are very commonly used to maintain memories and events that formed a part of a person's life. These collections serve to augment the human memory and enrich the process of sharing stories related to the memories. When organized, viewed and shared on a regular basis a collection of memory artifacts generates a large reward, enriching the lives of all involved. The nature of these collections is such that they grow steadily, event by event, year by year, and soon become large and difficult to manage. Collections of photos and memorabilia are considered one of the most important and valued possessions by most people. They are the first things that people think of when forced to flee their homes due to fire, flood or other natural disaster. These collections possess emotional value, even if they are rarely viewed, because the intrinsic need to preserve lives memories is strong and universal. Because of the relative importance of these memories to the persons involved, the prior art is replete with teachings that disclose organizational methods.

[0003] The most common manner of organizing these collections within the prior art is to place the photos, videos or memorabilia into either an album or a box. Common vinyl album pages provide the means to store and view between one and five standard sized photos per page. Creative people often spend hours carefully selecting and arranging photos, writing captions, clipping newspaper articles, and other memorabilia to create visual stories or scrapbooks. Once organized into groups or pages these photocollages greatly enhance a person's ability to remember and share the story surrounding the depicted events. These simple organization tools allow the collections to be easily viewed and also serves to protect the artifacts themselves. There are numerous types of albums and boxes available in the market today, ranging from simple vinyl sleeves to boxes manufactured from specialized materials designed to preserve the artifacts. Album vendors include Pioneer Photo Albums, Design Vinyl and Cason-Talens. Box vendors include Exposures. None of these prior art disclosures provide a means by which a photocollage of these memorable events can be easily constructed by persons to who these event means so much.

[0004] As used herein photocollage refers to a single

page having a plurality of images, such as a page in a photo album, or a composite image having a number of images relating to a single theme such as a vacation, wedding, birthday party or the like. The concept of photocollage as used herein also includes the concept of a bound photo album having a plurality of pages, one or more of which is a photocollage.

[0005] Despite the fact that many people are engaged in collecting these memorable artifacts, few people have the free time available to invest on a regular basis to organize and maintain them. Before long, the amount of unorganized material becomes a significant psychological barrier to getting organized. Other barriers exist which prevent people from actively maintaining these memorabilia collections such as confidence in their process, access to the materials, or remembering the details about the event. Often, once people get started on this organizational task they find it rewarding and fun, but still a significant amount of work.

[0006] Many attempts have been made to provide tools for working with or organizing photo and memorabilia collections. Computer software programs such as Picture-It™, by Microsoft, or Creative Photo Albums™, by Dog Byte Development, allow people to work with digital versions of their photos and create digital versions of an album or print them on a home printer. Software products such as these require that each photo or artifact exist in digital form before they can be used. Although these products increase the ability to change and enhance photos and scanned memorabilia they do not reduce the amount of work needed to organize collections or create visual stories. Other services such as Photo-Net™ by PictureVision™ will scan photographs in a high-quality format at the time of photo processing and provide a thumbnail image of the scanned images via the Internet. A customer, using these scanned images can create collections of photos which can be viewed on the Internet or have prints generated. Currently some of these services do not allow for the arrangement of several photos on a page and are limited to consumers who have a collection of digital images and a computer connected to the Internet and who are both computer and web literate.

[0007] It should be apparent from the foregoing discussion that there remains a need within the art for a method by which consumers can create photo albums and have them made for them in a previously selected manner that is as simple as ordering prints.

### SUMMARY OF THE INVENTION

[0008] The present invention addresses the foregoing discussed shortcomings in the prior art by creating an index print having a unique identifier so that a stored digital version of the image can be quickly accessed from a file. Accordingly, the present invention addresses the need for an improved method of generating photo albums from consumer photographs that requires a

minimum amount of effort but yields a high-quality and is reasonably priced.

[0009] The present invention is directed to overcoming one or more of the problems set forth above. Briefly summarized, according to one aspect of the present invention, a method of constructing a photo album includes the steps of providing a plurality of images; generating an index print of thumbnails from the digital images, the index print including a machine readable means for selecting one or more of images represented by the thumbnails to be included in the photo album; selecting one or more of the thumbnail images on the index print; reading the selected thumbnails from the index print with a scanner; and constructing a photo album from the digital images represented by the selected thumbnails.

[0010] The present invention also addresses the foregoing discussed shortcomings in the prior art by providing a method for creating photo albums wherein the customers can select and preview the entire layout of the photoalbum. The individual pages are created as a series of photocollages from sticker layout forms that are filled with index stickers. Each of the index stickers has a low resolution version of an image with a unique identifier correlating the index sticker to a high resolution version of the image that can be quickly accessed from a database file. The index stickers fit on individual layout sticker sheets, the layout sticker sheets are stickers that are used to form the individual pages of the photoalbum. Accordingly, the present invention addresses the need for an improved method of generating photo albums from consumer photographs whereby, the customer selects that exact orientation of the images that will comprise the photoalbum and that requires a minimum amount of effort but yields a high-quality product and is reasonably priced.

[0011] The present invention is directed to overcoming one or more of the problems set forth above. Briefly summarized, according to one aspect of the present invention, a method of constructing a photo album includes the steps of providing a plurality of images; generating a sticker sheet of reduced resolution images from the full resolution digital images, the sticker sheet including a machine readable means for identifying the high resolution images to be included in the photo album represented by the reduced resolution stickers; selecting one or more of the reduced resolution images on the sticker sheet; placing the reduced resolution stickers onto a page layout sheet which indicates size of the image on the page, number of images per page, and textual additions, reading the selected reduced resolution images on the page layout sheet with a scanner; and constructing a photo album, or a photocollage from the digital images represented by the selected reduced resolution images and layout sheets.

[0012] These and other aspects, objects, features and advantages of the present invention will be more clearly understood and appreciated from a review of the follow-

ing detailed description of the preferred embodiments and appended claims, and by reference to the accompanying drawings.

## 5 ADVANTAGEOUS EFFECT OF THE INVENTION

[0013] The present invention has the following advantages: Allows the user to have (1) an easy method of choosing photos and laying them out as photocollages on pages for creating professional looking photo albums which can be previewed instantly, (2) duplication of the photo albums, and (3) keeping the photo albums as files for later use.

## 15 BRIEF DESCRIPTION OF THE DRAWINGS

### [0014]

FIG. 1 is a block diagram showing the basic system elements to generate the sticker sheet useful for practicing the present invention; and

FIG. 2 is a system diagram showing a digital image processing system envisioned by the present invention;

FIG. 3a is a drawing of a thumbnail sketch sheet of reduced resolution images to be used with the present invention;

FIG. 3b is a drawing of a sticker sheet of reduced resolution images to be used with the present invention;

FIG. 4 is a flow chart showing the steps performed in the method of the present invention.

FIG. 5 is a drawing showing some of the layout styles available for a photocollage page within the photoalbum;

FIG. 6 is a drawing showing the layout of a cover page for the photo album;

FIG. 7a is a page layout form for the photo album as envisioned by the present invention;

FIG. 7b is an illustration of the cover page to similar to that shown in shown in FIG. 6 to be used in conjunction with the page layout form of FIG. 7a;

FIG. 8a is a box of stickers similar to those shown in FIG. 3b only arranged in pads of stickers;

FIG. 8b is sheet of page layout sheet stickers each having a plurality of positions to accept stickers from the box of sticker pads shown in FIG. 8a;

FIG. 9a is a sticker sheet similar to that shown in FIG. 3b;

FIG. 9b is an illustration of page layout stickers similar to those shown in FIG. 8b;

FIG. 9c is a page layout form as shown in FIG. 7a;

FIG. 10 is one of the preferred embodiments of the present invention illustrating a game box approach to making photo albums.

FIG. 11 illustrates the page layout form used in generating photo albums as envisioned by the present invention;

FIG. 12 is a more detailed illustration of the layout form shown in FIG. 6;

FIG. 13 is an illustration showing the placement of stickers on the layout form.

[0015] To facilitate understanding, identical reference numerals have been used, where possible, to designate identical elements that are common to the figures.

## DETAILED DESCRIPTION OF THE INVENTION

[0016] We have discovered that a photo album or photocollage can be created in a simple and effective manner by supplying those consumers who take pictures with an index print of their developed pictures. Referring to FIG. 1, a consumer sends their roll of exposed film 10 or Digital Still Camera memory cards 12 to a photofinisher 14, and the customer receives a set of prints 16 and an index print 18 that is to be used as a selection tool. The index print 18 has a low resolution version (thumbnail) of each of the photographs taken and has a unique identifier for each of the thumbnails. Additionally, the selection tool can be a sticker sheet 28 having a unique identifier for each of the prints 16.

[0017] Referring to Fig. 2, which is the system 5 as envisioned by the present invention, viewed in conjunction with Fig. 1, conventional film processing takes place with potential correction of exposed photographs via operator interface 31. Operator intervention typically takes place once exposed photographs are seen as having incorrect brightness or color content. A preferred system will have, in addition to the printing apparatus typically employed by a photofinisher, a film scanner 20. At the photofinisher 14, exposed film images are chemically processed to generate an optical image. These optical images are then scanned using the digital film scanner 20 to produce a high resolution digital file that is archived in an image store 24. In general to produce a high resolution printed image of 8x10 inch size a resolution of 1538 x 1024 pixels is required. The Digital still camera images are digitally processed to produce an equivalent digital image file of similar size. These digital images are then processed using a low-pass frequency filter and spatial sub-sampling to generate a thumbnail version approximately 384 x 256 pixels in size, as shown in the Flashpix toolkit on the Eastman Kodak World Wide Web site ([www.kodak.com](http://www.kodak.com)). These thumbnail images are used to form an index print by index printer 29 and printed on a paper media.

[0018] The original high resolution images are archived in image storage 24 for future use. This archive of digital images would, in most cases, comprise a software database application and a large collection of optical or magnetic storage media. In order to allow for the future association of the high-resolution images with their corresponding low-resolution thumbnail images, each image is assigned a unique identifier. There are a variety of means, known in the art, for the generation of

this unique identification. One such means is disclosed in Townsend and Shaffer, U.S. Patent No.: 5,784,461 (which is commonly assigned with the present application for invention) in which a combination of the customer identification information and the photofinishing location, equipment, and date and time are combined. Other means of unique identification could be employed so long as they provide a one-to-one association of a person to a single image. The assigned unique image identification is associated with both the high and low resolution versions of the image. The low resolution, thumbnail images are further processed to generate a formatted array or index-print 18 as shown in Fig. 3a or a sticker sheet 28 as shown in Fig. 3b.

[0019] Referring to Fig. 3a, the index print 18 also includes a graphic depiction of a selection means for choosing the images to be used in a customer product such as an album (with or without an album cover). The customer product can also be other image documents such as greeting cards, stamps, posters or the like. The unique image identification is also included in the printed index print. In a preferred implementation this unique image identification is embedded directly into the pixels of the thumbnail image using signal processing techniques.

[0020] The method of embedding digital data in an image can be best considered in its two stages; an encoding process and a decoding process. First, a multi-level data image is generated from digital data. The multi-level data image as described in detail below is an image having a constant background value and an array of spots on the background representing the digital data. The data image may be produced using digital image processing techniques, or may be produced optically for example by exposing spots on a photographic film.

[0021] Next, the data image is convolved with an encoding carrier image to form a frequency dispersed data image. The encoding carrier image is preferably a rotationally symmetric, low amplitude, high frequency pattern employed to spatially disperse the data image to mask its visibility when added to the source image. Preferably the convolution is performed on a digital computer using a well known Fourier Transform method and digital versions of the data image and the encoding carrier image. The convolution may also be performed using a direct convolution algorithm on the digital computer. Alternatively, the convolution may be performed optically using well known optical convolution techniques and optical versions of the data image and the encoding carrier image.

[0022] The frequency dispersed data image is then added to the source image to form a source image with embedded data. As described in more detail below, the addition may be performed either optically using traditional photographic processes, or digitally using a digital computer and digital versions of the source image and the frequency dispersed data image. If the addition is

performed digitally, a hard copy version of the digital source image having embedded data may be produced using a digital printer such as a thermal, ink-jet, electro-photographic, or silver halide printer.

[0023] The digital data is recovered from the source image having embedded data by first cross correlating the source image having embedded data with a decoding carrier image to produce a recovered data image. Preferably, the decoding carrier image is identical to the encoding carrier image and the cross correlation is performed by a digital computer on digital versions of the source image having embedded data and the decoding carrier image. If a hard copy of the source image having embedded data is used, the hard copy is first scanned as described in detail below to produce a digital version. Alternatively, the cross correlation may be performed using well known optical techniques and optical versions of the source image having embedded data and the decoding carrier image.

[0024] Finally, the digital data is extracted from the recovered data image. Preferably, the digital data is extracted from a digital version of the recovered data image using a pattern recognition process in a digital computer. Alternative methods for encoding data within an image can be found in issued U.S. Patents: 5,636,292; 5,128,525; 5,285,438; and 5,126,779 which can also be used with the present invention.

[0025] Alternatively, the image identification is printed adjacent to the thumbnail image on the index print in a human readable form. A customer indicates which images they want by checking a box 34 adjacent to the thumbnail image, or otherwise marking the thumbnail image on the index print for every image they want included in a photocollage such as a photo album. Alternatively, the user can place an "X" mark over the top of all images that they do not want included into an album. Once the selection has been made the consumer sends the marked index print to the photofinisher to have the photocollage prepared.

[0026] Again referring to Fig. 2, after receiving the index print 18 the customer uses the index print 18 to make selections of which images they want included in a photocollage. As used herein photocollage refers to a single page having a plurality of images, such as a page in a photoalbum, or a composite image having a number of images relating to a single theme such as a vacation, wedding, birthday party or the like. The concept of photocollage as used herein also includes the concept of a bound photo album having a plurality of pages, one or more of which is a photocollage. The photocollage is created when the customer sends in the index print 18 with the selections made by scanning the index print 18 using index print scanner 26 and generate a list of images to be used in the photocollage. Information about orders such as customer name quantity etc., are entered into the system via the operator interface 31

[0027] Using the generated list of images the photocollage processor 33 finds and retrieves the corre-

sponding high resolution images that were previously stored in the image storage 24 which are associated with the unique image identification numbers that were supplied by the scanned index print 18. These high resolution images are then assembled into a photocollage such as an album page layout using a page description language or template following graphical rules. These graphical rules incorporate customer preferences such as number of images per page, size of the pages, background styles and colors, etc. In this page layout process it may be necessary to zoom and crop the images to optimize the layout or to match customer preferences. The photocollage pages are then assembled and rendered by the digital image processor 32 and printed via the page/album printer-finisher 35. A well known image processing software application such as Quark Xpress® or Adobe Photoshop® is used for these functions.

[0028] Fig. 2 illustrates the preferred embodiment of the present invention wherein each of the components has an interface to either the internet or some other network. The individual components need to individually reside on the same network. Certain components will exist at the photofinishers such as the index printer, the film scanner 20. Other subsets of system 5 would exist at multiple locations such as having a print shop with the page/album printer finisher 35 and a remote processing site providing services for the digital image processor 32.

[0029] Referring to Fig. 4, which illustrates the process steps that are performed from developing photographs to generation of photocollages. The customer brings in exposed film 42 or a memory card from a digital camera 43 containing images that are to be made into a photocollage. The photofinisher generates traditional prints 46 for the customer. In the case of film, the film is scanned 45 to create a digital image. Once acquired, the digital images are assigned a unique ID 49 and placed into digital storage 50. An index print 18 is generated 48 which is sent to customer for selection of images to be used in the photocollage. The index print 18 can be sent to the customer along with their prints. The customer selects the desired images 51 from the index print 18 and also selects the type of product 53 from a standard order form supplied with index print 18. The customer then returns the index print to the retailer 55 where the index print is scanned with the index print scanner 26 to determine what images are to be used in the photocollage, the cover image, and the product type 57. The unique identifiers from the images are then associated with the images stored in the online storage facility and these full scale images are retrieved 52. The photocollage is then constructed and printed 54 and sent to the customer 56.

[0030] For those cases where the consumer sends the printed index print 18 to place the album order, an operator scans the index print using the index print scanner 26. This scanned image of the index print is

then processed to locate and find the marks used by the customer to select images for album creation. Algorithms employed to locate and interpret such handwritten marks are known in the optical character recognition art. In addition to processing the selection marks on the index print the scanned index print image is further processed to extract each selected image identification number. Depending upon the method employed for rendering the image identification number within the index print a variety of image processing techniques would be employed. In the case of human readable image identification numbers optical character recognition software is employed that translates the scanned image of the characters to a digital number representation. In the case where the image identification was hidden within the pixels of the thumbnail image, a reverse of the data embedding signal processing technique is employed. The images are processed to remove any rotation and scale variations introduced in the printing and scanning steps. The result of this processing is to generate a list of the identification numbers of the images which the customer desires to have placed into the photocollage.

[0031] The method communication the selection of the thumbnails on an index print further comprise the provision of electronic communication means for transmitting the contents of the index print including: a touch-tone phone, a facsimile transmission, or a touchpad.

[0032] The unique identifier can be any of either: embedded data contained within the pixels themselves, invisible ink, visible codes, histogram, or color information.

[0033] Referring to Fig. 3b, the sticker sheet 28 has a plurality of index stickers 27, each of the index stickers 27 includes an alpha numeric human readable image identifier 19 which allows the user to locate the corresponding photographic print of the index sticker 27 image. In addition each of the index stickers 27 has a unique machine-readable image identification is also included in the printed sticker sheet. The machine readable image identification could take the form of a bar code, machine readable characters or any one of a number of data-encoding patterns. A preferred implementation of this unique machine readable image identification is to embed it directly into the pixels of the thumbnail image using signal processing techniques as previously described.

[0034] A customer wishing to construct a photocollage selects one or more images by peeling the individual index stickers 27 from the images contained on the sticker sheet 28 and placing the selected index stickers 27 on any of the page layout stickers 61 selected from the layout options page 69 as shown in FIG. 5. The layout options page 69 includes page layout stickers 61 each showing a scaled graphic depictions of the final page and each comprising a unique page layout. In one embodiment each scaled page representation includes one or more graphic image boxes each of which is an allowable location to place an index sticker 17. Different

page layout sticker 61 representations depict the available album page layouts that are available by the embodiment shown in FIG. 5. Different page layout choices allows variety in: the dimensions of the image; the number of images per page; the arrangements and accommodation of both portrait (vertical) and landscape (horizontal) captured original images; the provision for annotation text; and different size original images including standard 35mm, Advanced Photo System classic, HDTV and Panoramic images and, Digital Still Camera formats. Special page layout stickers are also provided for cover pages 67 as shown in FIG. 6. The scale of the index sticker images 27 and the scale of the sticker position 62 on the page layout sticker do not have to be the same. If the page layout sticker has a sticker position 62 that is larger than the index sticker 27, the image is enlarged to fill the box when producing the final printed album page. If the page layout sticker has a sticker position 62 that is smaller than the index sticker 27, the image is reduced to fill the box when producing the final printed album page. In this way a variety of final output sized images can be made available to the user without the need to produce multiple sizes of sticker images. The page layout stickers 61 can be arranged in a variety of ways by rotating the page layout stickers 61 to different orientations when placing them on the page positioning form 60.

[0035] Once the images and the layout have been selected and the preview album constructed, the consumer sends the completed page positioning form 60 to the photofinisher to have the photo album. The method of communicating the selection of the index stickers 27 within the page positioning form 60 by the further comprise the provision of electronic communication means for transmitting the contents of the index stickers 27 and the page position form 60 including: a touch-tone phone, a facsimile transmission, or a touchpad connected to a computer.

[0036] The photo album is created when the customer sends in the index stickers 27 on the page layout stickers 61 as arranged within the page positioning form 60 representing the desired images for the photocollage. The roll information, and the images to be used in the photocollage are identified by scanning the images and layouts within the page positioning form 60 cover and layout sheet scanner 26. Information about orders such as customer name, quantity, etc., are entered into the system via the operator interface 31.

[0037] Using the generated list of images the photocollage processor 33 finds and retrieves the corresponding high resolution images that were previously stored in the image storage 24 which are associated with the unique image identification numbers that were supplied by the scanned page positioning form 60. These high-resolution images are then assembled into a photocollage using the layouts as described in the page layout stickers 61 and the page positioning form 60. Customer preferences such as size of the pages,



background styles and colors, etc are entered through the operator interface 31 or via a customer preference sheet. In this page layout process it may be necessary to zoom and crop the images to optimize the layout or to match customer preferences.

[0038] Fig. 2 illustrates the preferred embodiment of the present invention wherein each of the components has an interface to a common network 5. Certain components will exist at the photofinishers such as the sticker sheet printer/cutter 29, the film scanner 20. Other subsets of the system would exist at multiple locations such as having a print shop with the page/album printer finisher 35 and a remote processing site providing services for the digital image processor 32.

[0039] Depending upon the method employed for rendering the image identification number within the index sticker 27, a variety of image processing techniques would be employed. In the case of human readable image identification numbers optical character recognition software is employed that translates the scanned image of the characters to a digital number representation. In the case where the image identification was hidden within the pixels of the reduced resolution image, a reverse of the data embedding signal processing technique is employed. The images are processed to remove any rotation and scale variations introduced in the printing and scanning steps. The result of this processing is to generate a list of the identification numbers of the images which the customer desires to have placed into the photocollage.

[0040] FIG. 7a illustrates a page positioning form 60 that is used in conjunction with the page layout sticker forms 61 within the method of constructing a photo album as envisioned by the present invention. The page positioning form 60 provides a plurality of blank pages 64 each of which can hold at least one page layout sticker 61. Each of the page layout stickers 61 in turn has at least one index sticker 27 position 62 that is used to provide a place within the final photo album for the index stickers 27 previously described. These index stickers 27 each have a low resolution image with a unique identifier that cross references each of the stickers to a high resolution version of the low resolution image contained on the index stickers 27. FIG. 7b is an illustration of the cover page sticker 67 which is similar to that shown in shown in FIG. 6 to be used in conjunction with the page positioning form 60 of FIG. 7a. The page positioning form 60 has an initial page 65 that is used with the cover page sticker 67.

[0041] FIG. 8a illustrates a box 70 of page layout stickers 61 arranged in stacks 72 that have reusable adhesives as conventionally known. Here, it is envisioned that each of the stacks 72 will have duplicate copies of the page layout stickers 61, and that different stacks 72 typically contain different layouts enabling the greater variety in the generation of photo albums. FIG. 8b is an example of one arrangement layout possibilities of the page layout stickers 61 each having a plurality of sticker

positions 62. The individual stickers 27 are placed in the individual positions 62 as desired by the user. The page layout stickers 61 containing the index stickers 27 are then removed and placed on the page positioning form 60 as shown in FIG. 7a to create a miniature representation of the photo album to be generated. The placing the index stickers 27 on the page layout sheets 61 and arranging the page layout sheets 61 on the page positioning form 60, illustrate the preferred method of practicing the invention, especially when the page position form 60 is provided as a booklet. By providing the page position form 60 as a booklet made from a single piece with folds to separate the pages, a simple and economical method of making a miniature version of the intended photocollage is disclosed that allows users to view a representation of the photocollages that they themselves have created. This miniature photo album can then be sent to a service provider to have a full sized version made using the high resolution version of the images to generate a high resolution, full sized photo album. This provides an album which results in a very professional looking final product at a fraction of the cost typically incurred having a professional photo album made.

[0042] Referring now to FIG. 9a through FIG. 9c to quickly surmise the present invention, a sticker sheet similar to that shown in FIG. 3b having a plurality of stickers 27 each with an individual low resolution image is used to provide the images that will be arranged within the sticker positions 62 on the page layout stickers 61 as shown in FIG. 9b. The page layout stickers 61 having the desired images placed on them are removed as individual stickers themselves and placed in desired positions on the page positioning form 60, as indicated by the arrows pointing from FIG. 9a to FIG. 9b.

[0043] FIG. 9b is an illustration of page layout stickers 61 similar to those shown in FIG. 8b. These page layout stickers 61 are placed in the page positioning form 60 seen in FIG. 9c to create a representative photo album that is desired by the user.

[0044] FIG. 10 is an illustration of one of the preferred embodiments of the present invention wherein a typical game box approach is used in making photo albums. The game box 90 includes numerous album layout books 92 each similar to the page positioning forms 60 previously discussed, sticker pads 94, professional pictures 96 and professional art work 98. The inclusion of these items within Game Box 90 makes the generation of photo albums less tedious and more like playing a game. Photographs, or any pictures and artwork, can be stored in a safe, easy to use place. The set of graphic arts to be used as part of the cover page or simply to decorate the photo album in various places.

[0045] Additional stickers are provided representing stock images from, theme parks, national monuments and other popular topics that can be incorporated within the photocollage via the layout sheets. This allows the customer to use professional content to augment the

appearance and value of the photocollages. High resolution representations of these additional content stickers would also have to be contained within an image database and would require unique identifiers similar to the personal images. There can be a variety of boxes provided, each themed at a particular event or location with stickers containing professional content aimed at that particular event or location

[0046] Depending upon the method employed for rendering the image identification number within the sticker sheet a variety of image processing techniques would be employed. In the case of human readable image identification numbers optical character recognition software is employed that translates the scanned image of the characters to a digital number representation. In the case where the image identification was hidden within the pixels of the reduced resolution image, a reverse of the data embedding signal processing technique is employed. The images are processed to remove any rotation and scale variations introduced in the printing and scanning steps. The result of this processing is to generate a list of the identification numbers of the images which the customer desires to have placed into the photocollage.

[0047] FIG. 11 illustrates a page layout form 100 that is used in conjunction with the index sticker employed by the method of constructing a photo album as envisioned by the present invention. The present invention as illustrated in FIG. 11 offers significant improvements including ease of use in reduction in the amount of materials handled over prior art methods for creating photo albums. The page layout form 100 provides a plurality of blank pages 104 each of which have a plurality of layouts 101 that can be selected for that page. The layouts 101 are arranged in columns within the preferred embodiment, each column having a plurality of different layouts. One of the layouts 101 is selected for each of the pages. Typically, the layout sheet 100 is used by placing the index stickers on one of the layouts 101 within each column to select the layout style that will be used by that page within the final photoalbum. These index stickers each have a low resolution image with a unique identifier that cross references each of the stickers to a high resolution version of the low resolution image contained on the stickers.

[0048] FIG. 12 is an enlarged illustration of the page layout form 100 shown in FIG. 11 illustrating the various layouts that could conceivably be made available to be used in conjunction with the page layout form of FIG. 11. The page positioning form 100 has an initial page 105 that is used with the cover page 108. FIG. 12 illustrates a plurality of layouts 101, one of each being available for each of the pages 104. Additionally, a cover page 108 is provided having a text selection area 107 that can be used to place specified text on the cover of the album to be created. Cover page also has a selection of backgrounds 109 that can be used in addition to any particular image that is selected for the

cover. The backgrounds can be chosen such that a single background is used throughout the album or different backgrounds can be used on different pages within the album.

[0049] Referring now to FIG. 13 to quickly surmise the present invention, a sticker sheet similar to that shown in FIG. 3 having a plurality of stickers 17 each with an individual low resolution image as previously discussed is used to provide the images that will be arranged within the page layout form 104 in a manner similar to that shown in FIG. 13. The page layouts 101 that are available for each of the pages 104 allow the user to select the desired placement of the images in each page of the photoalbum. A typical layout is shown in FIG. 13 by the arrows placing the stickers 17 on the various layouts 101.

[0050] Additionally, stickers can be provided representing stock images from, theme parks, national monuments and other popular topics that can be incorporated within the photocollage via the layout sheets. This allows the customer to use professional content to augment the appearance and value of the photocollages. High resolution representations of these additional content stickers would also have to be contained within an image database and would require unique identifiers similar to the personal images.

[0051] The invention has been described with reference to a preferred embodiment. However, it will be appreciated that variations and modifications can be effected by a person of ordinary skill in the art without departing from the scope of the invention.

#### PARTS LIST

[0052]

5	internet or network
10	exposed film
12	memory cards
14	photofinisher
16	prints
18	sticker sheets
19	numeric identifier on stickers
20	film scanner
24	image storage
26	sticker sheet scanner
29	sticker printer/cutter
31	operator interface
32	digital image processor
33	photocollage processor
34	box
35	printer finisher
42	exposed film
43	digital camera
44	Film processed
45	film digitization
46	prints returned
48	materials for photocollages returned to cus-

49 tomer  
 50 unique ID  
 51 digital storage  
 52 image selection and placement  
 53 high resolution image retrieval  
 54 product decision  
 55 photocollage printing  
 56 return of materials  
 57 finished product sent out  
 58 layouts scanned  
 60 page positioning form  
 61 page layout sticker form  
 62 sticker position  
 64 pages  
 65 cover page position  
 67 cover page sticker  
 69 layout options page  
 70 stickers  
 72 stacks  
 90 game box  
 92 album layouts books  
 94 sticker pads  
 96 professional pictures  
 98 professional art work  
 100 page layout form  
 101 page layout  
 104 blank pages  
 107 text area on cover sheet  
 108 cover sheet  
 109 background styles

#### Claims

1. A method of constructing a photo collage, comprising:

- a) providing a plurality of high resolution digital images;
- b) storing the high resolution digital images;
- c) generating an index print having a plurality of low resolution thumbnails representing the high resolution digital images, the index print including a means for uniquely identifying each of the thumbnails and for selecting one or more of the thumbnail images to be included in the photo collage;
- d) selecting one or more of the thumbnail images using the low resolution thumbnails from the index print;
- e) communicating the selection of the low resolution thumbnails from the index print;
- f) associating the low resolution thumbnails with the stored high resolution digital images; and
- g) constructing the photocollage from the digital images represented by the selected thumbnails.

2. The method of constructing a photocollage claimed in claim 1, wherein the means for uniquely identifying the reduced resolution thumbnails is a machine readable code and wherein the steps of communication the selection, associating the thumbnails with the stored digital images and constructing the photocollage are performed automatically.

3. The method of claim 1 wherein the index print employs as reduced resolution thumbnails a plurality of images having means for selecting each of the images.

4. The method claimed in claim 3, wherein the means for selecting an image to be included in the photocollage includes a box associated with each thumbnail image adapted to be checked by a customer.

5. The method claimed in claim 3, wherein the means for uniquely identifying the selected image is a bar code associated with the thumbnail image.

6. The method claimed in claim 1, wherein the means for uniquely identifying the selected image includes data embedded in the reduced resolution thumbnail image.

7. The method claimed in claim 1, wherein the photocollage is a digital data file.

8. The method of claim 1 wherein the index print employs as reduced resolution thumbnails a plurality of stickers, each of the stickers having means for selecting each of the high resolution images.

9. The method of claim 1 wherein the step of generating further comprises generating an index sticker sheet having a plurality of stickers, each of the stickers comprising a reduced resolution thumbnail representing one of the high resolution digital images and means for uniquely identifying the sticker with the high resolution digital image that is associated with that reduced resolution image.

10. The method of claim 9 further comprising the steps of: providing at least one page layout form for attaching the stickers to configure a photo collage representation;

assembling the photocollage representation by attaching the individual stickers to the cover and layout form;  
 employing the means for uniquely associating stickers images with the stored high resolution digital image; and  
 generating the photocollage from the stored high resolution digital images according to the

photocollage representation.

11. The method of claim 10 further comprising the step of communicating information regarding the photocollage to a photofinisher. 5
12. The method of claim 11 wherein information communicated to the photofinisher is selected from one of the following: product order information, color choice, background selection, or billing information. 10
13. The method of constructing a photocollage claimed in claim 9 wherein the means for uniquely associating each of the stickers is a machine readable code. 15
14. A photo album product formed from the steps of:
  - a) providing a plurality of index stickers each having a low resolution image with a unique identifier that cross references each of the stickers to a high resolution version of the low resolution image, a plurality of page layout sheets; 20
  - b) placing the index stickers on the page layout sheets; and
  - c) arranging the page layout sheets on the page positions. 25
15. The product of claim 14 wherein each of the page layout sheets itself being a sticker having at least one position for placement of index stickers within the positions, a photo album layout having a plurality of page positions, each of the page positions being configured such that there is room for at least one of the page layout sheets within the page position. 30 35
16. The product of claim 15 one wherein the step of providing further comprises providing the page positions in a booklet. 40
17. The product of claim 16 wherein the step of providing further comprises providing the page position such that it is a single piece with folds separating each of the page positions. 45
18. The product of claim 14 wherein the step of providing further comprises the step of providing a set of graphic arts to be used as part of the cover page. 50
19. The product of claim 14 wherein the step of providing further comprises the step of providing a text entry area to be used in conjunction with the cover page. 55
20. The product of claim 14 wherein the step of providing further comprises providing the high resolution version on a database.

21. A system for constructing a photo collage comprising:
  - a plurality of index stickers each having a low resolution image with a unique identifier that cross references each of the stickers to a high resolution version of the low resolution image; and
  - a page layout form having a plurality of pages, each of the pages having a plurality of page layouts.

22. The system of claim 21 wherein the page layout form further comprises a flexible medium that allows the pages to fold on top of one another and the page layouts to fold on top of one another.
23. The system of claim 21 wherein the page layout is formed such that it has folds separating each of the page positions.
24. The system of claim 21 further comprising means for adding additional stickers to the sticker sheet comprised of images relevant to one of a plurality of events selected from a library of images.
25. The system of claim 21 further comprising a cover page as the initial page position.

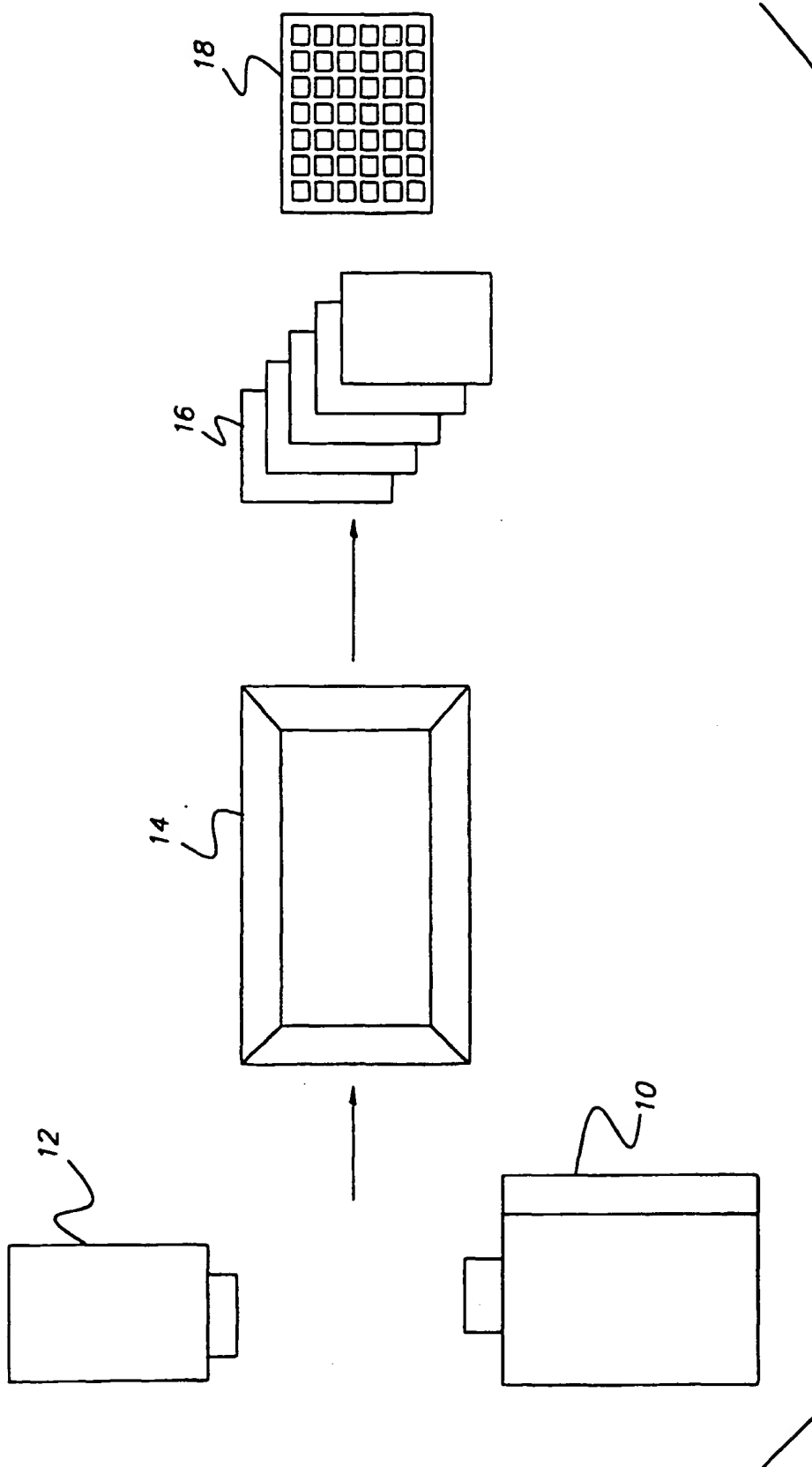


FIG. 1

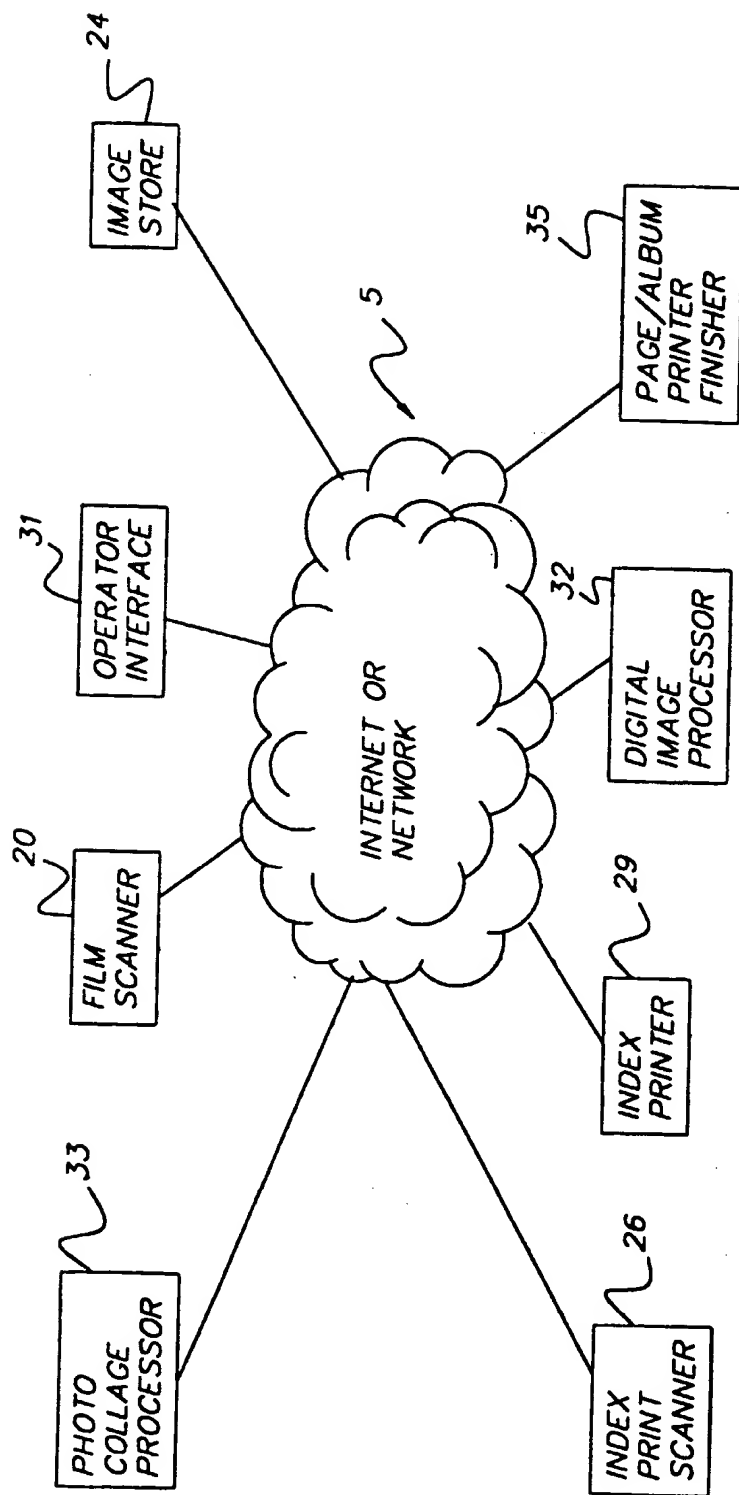


FIG. 2

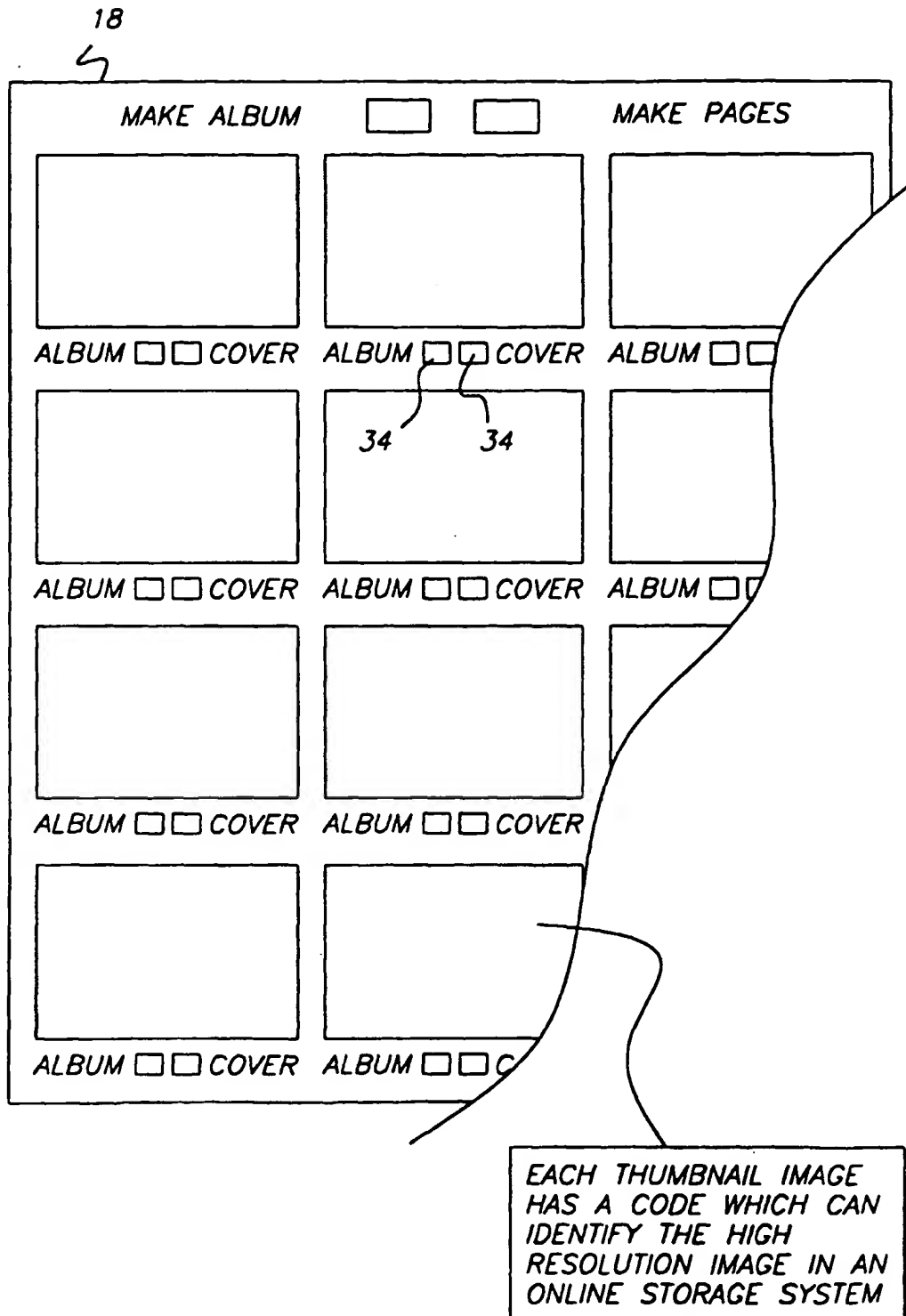


FIG. 3a

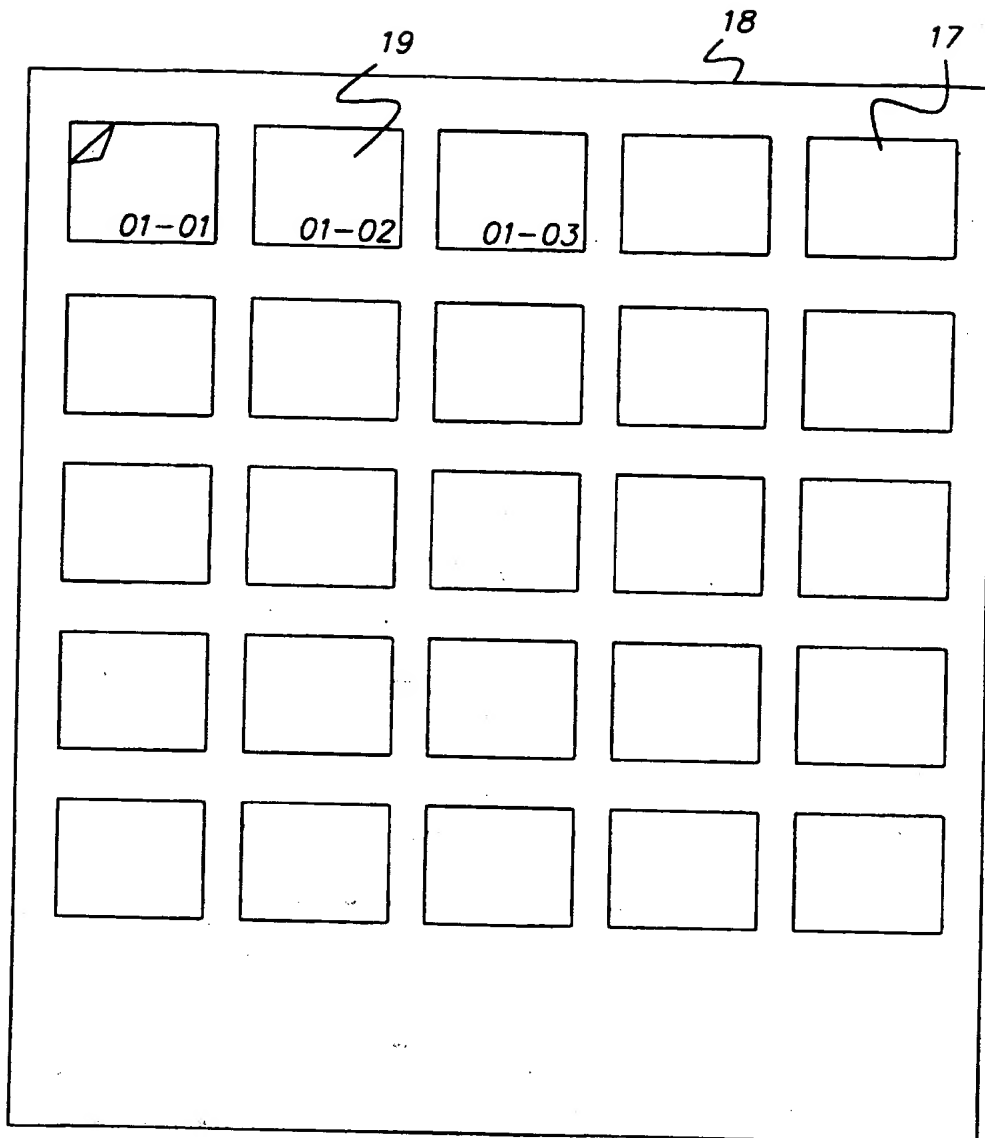


FIG. 3b



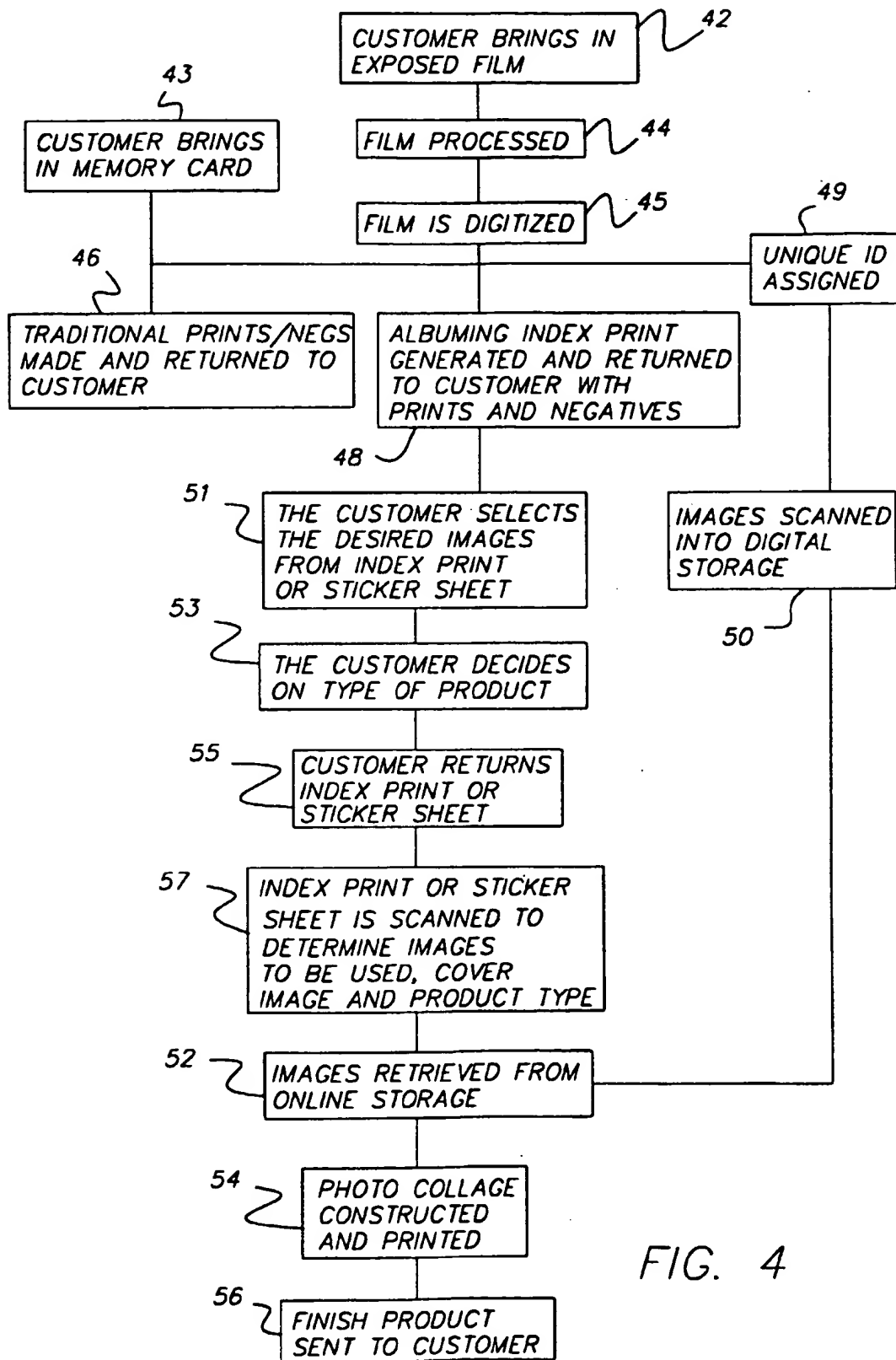


FIG. 4

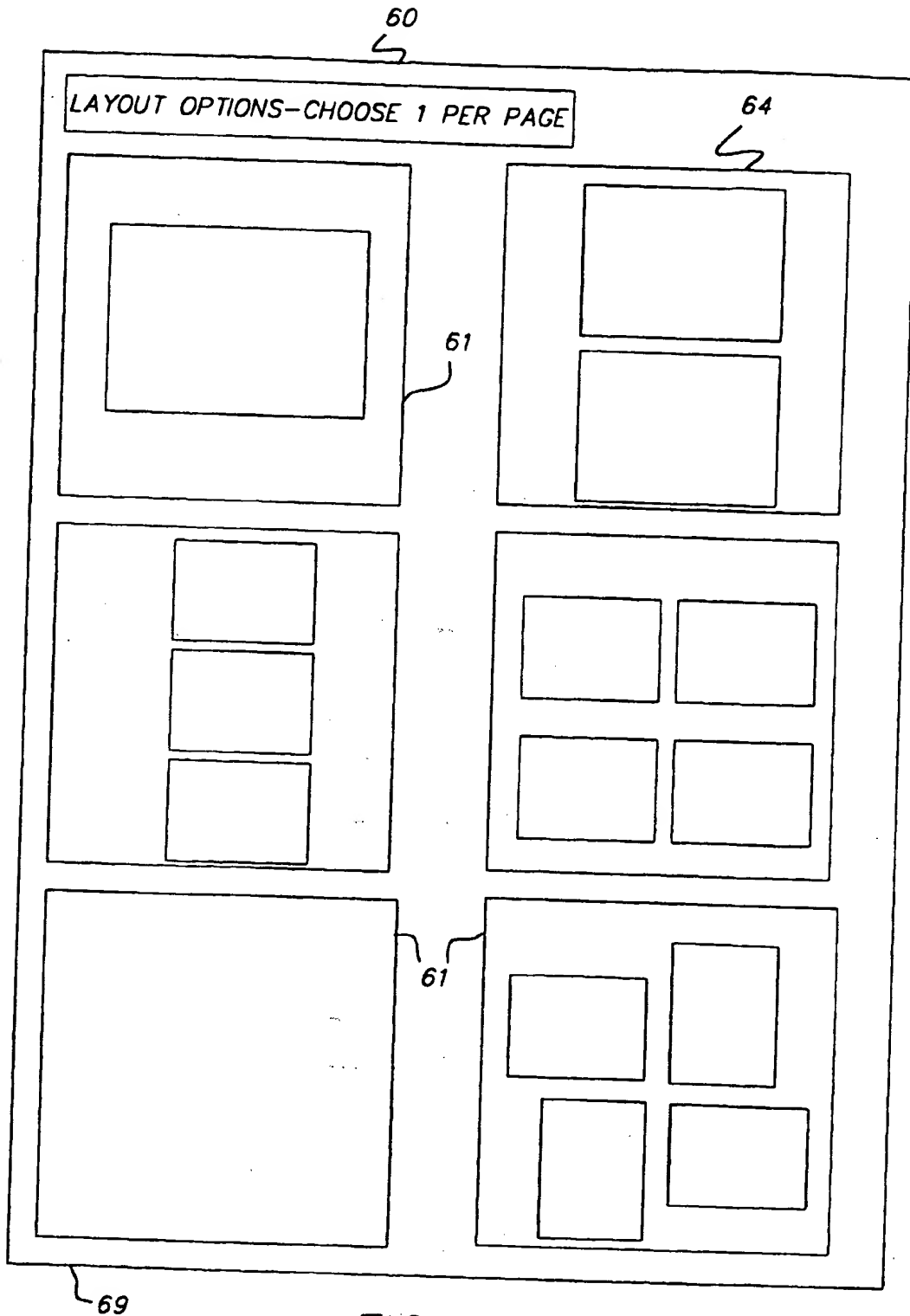


FIG. 5

67

6

The diagram illustrates a user interface for entering cover text. It is enclosed in a large rectangular frame. At the top right, outside the frame, are the numbers '67' and '6'. Inside the frame, there are two main input sections. The first section, located in the upper left, consists of a large rectangular box with the text 'TEXT FOR COVER' centered below it. To the right of this box is the text 'ENTER TEXT FOR COVER (OPTIONAL)' followed by three horizontal rows of 12 small rectangular input fields each. The second section, located in the lower left, consists of a large rectangular box with the text 'TEXT FOR COVER' positioned to its right. To the right of this box is the text 'ENTER TEXT FOR COVER (OPTIONAL)' followed by three horizontal rows of 12 small rectangular input fields each. At the bottom center of the frame is a rectangular button with the text 'CHOOSE 1 FOR COVER CHOICE'.

FIG. 6

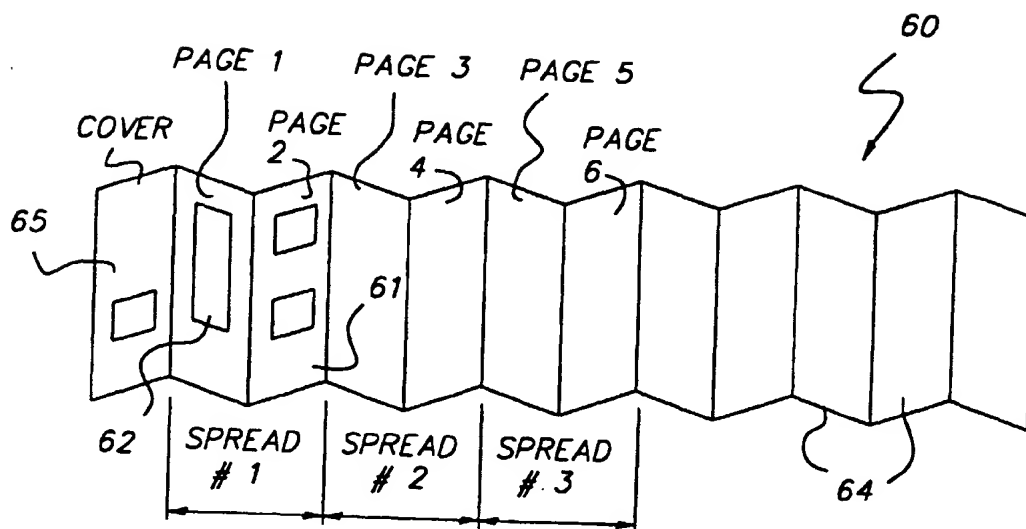


FIG. 7a

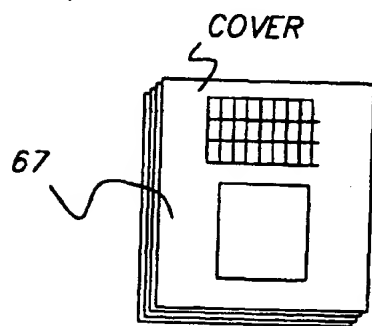


FIG. 7b

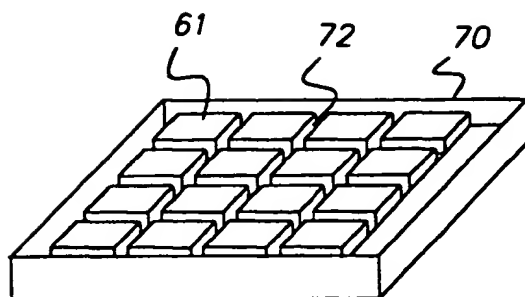


FIG. 8a

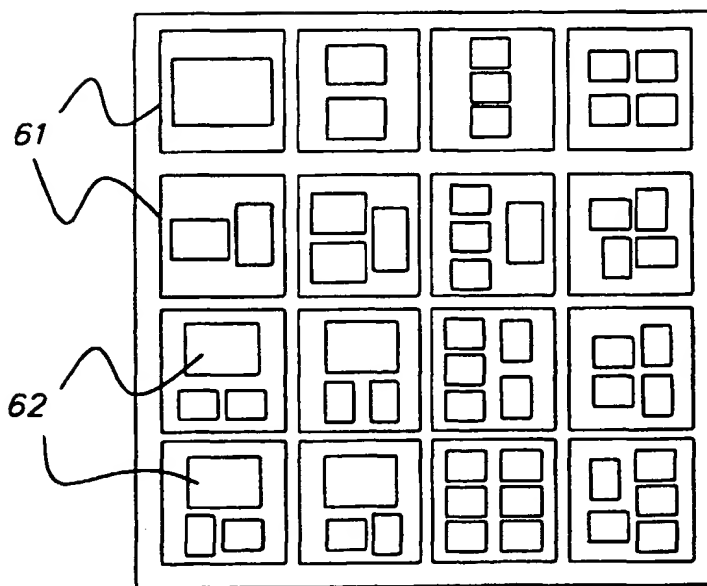
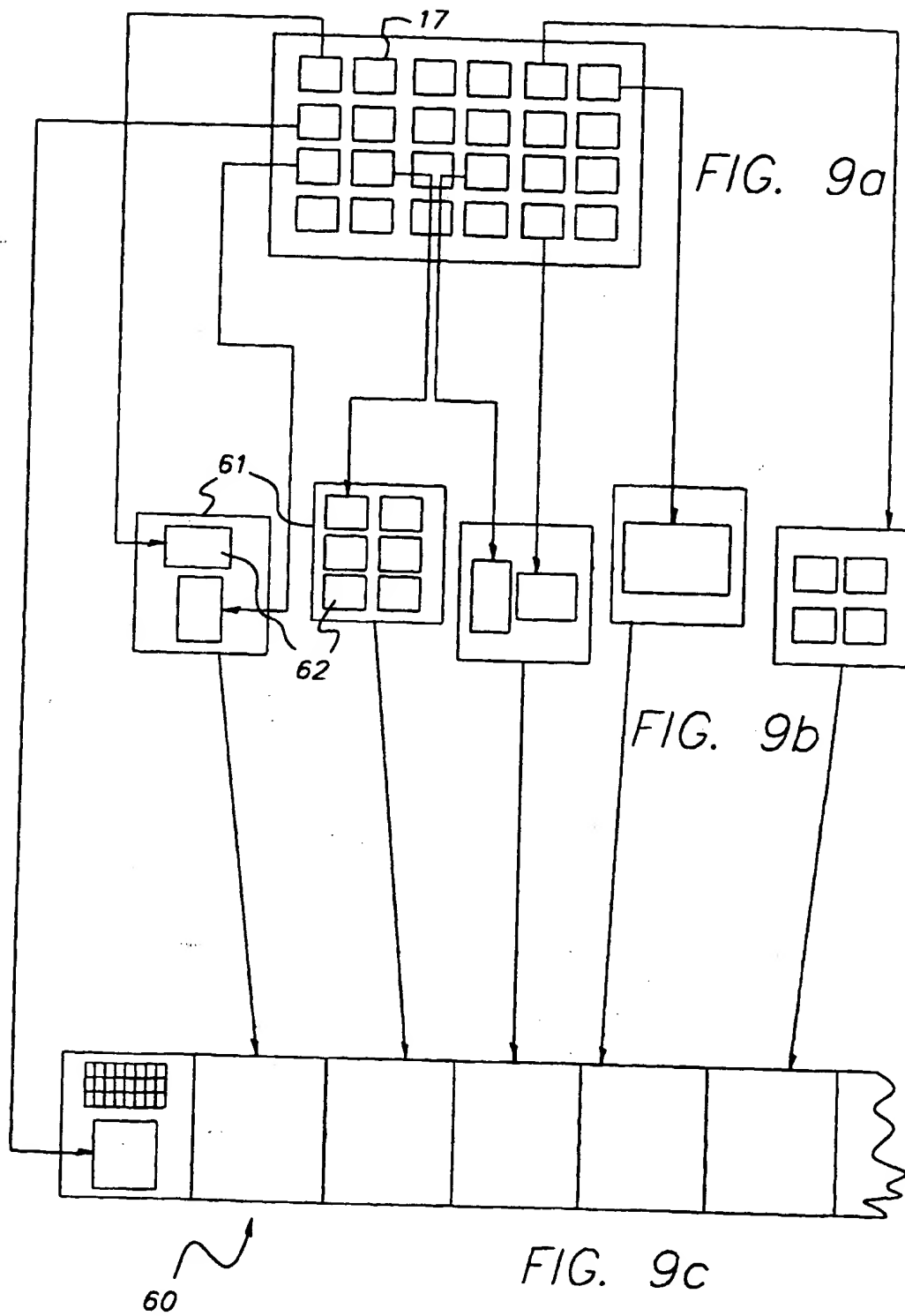


FIG. 8b



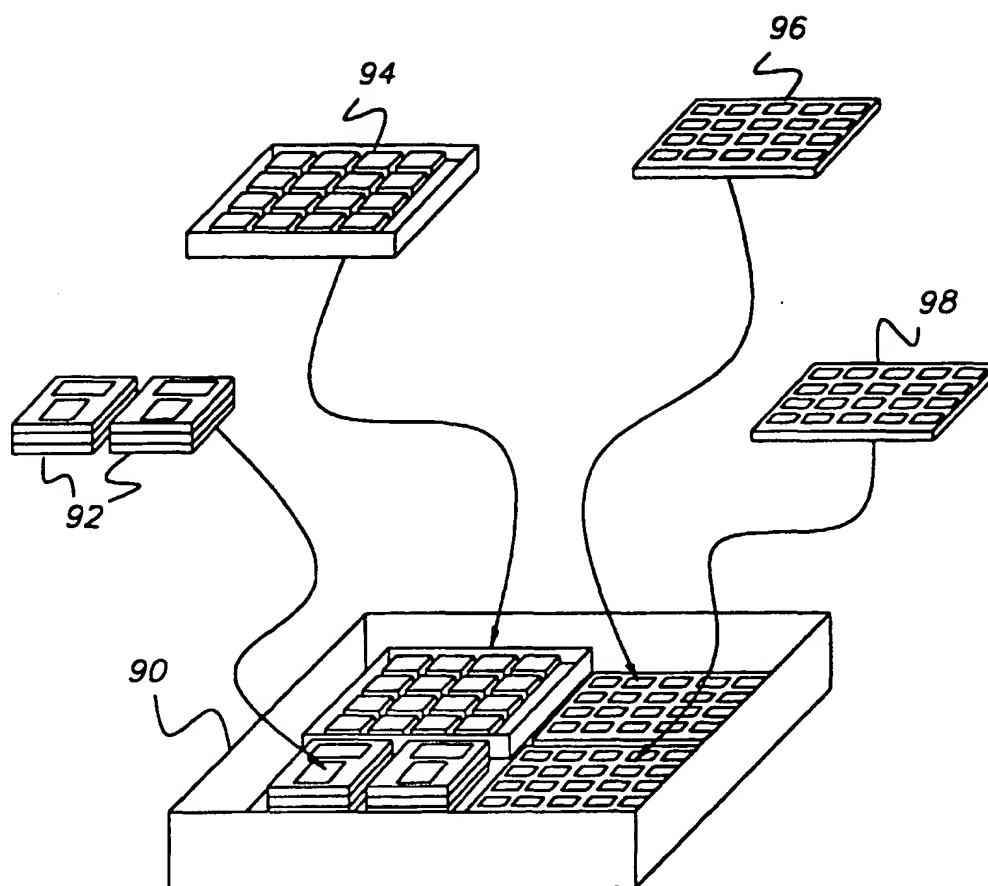


FIG. 10

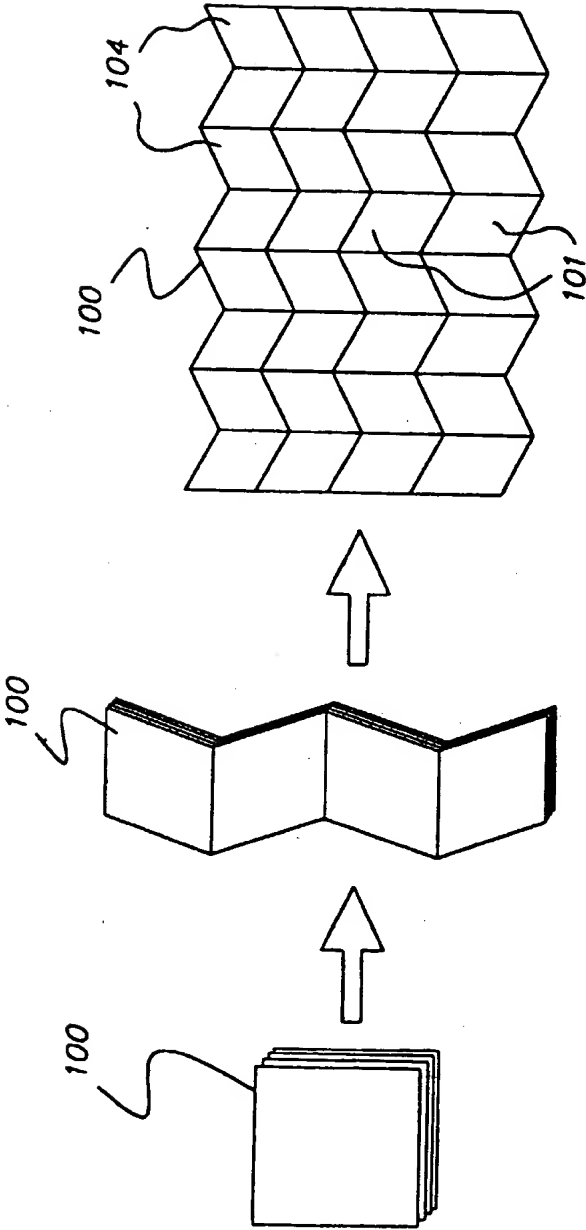


FIG. 11



Figure 1 is a schematic diagram of a form layout, likely for a book or album. The form is organized into a grid with four main columns: **COVER**, **PAGE 1**, **PAGE 2**, and **PAGE 3**. The rows are labeled with reference numerals: 68, 104, 107, 101, and 109.

- Row 68:** Contains the column headers: **COVER**, **PAGE 1**, **PAGE 2**, and **PAGE 3**.
- Row 104:** Contains the following text: **TEXT** (under COVER), **LAYOUT STICKER (1/PAGE)** (under PAGE 1), **LAYOUT STICKER (1/PAGE)** (under PAGE 2), and **LAYOUT STICKER (1/PAGE)** (under PAGE 3).
- Row 107:** Contains the text **TEXT FOR COVER** (under COVER) and a grid of boxes (under PAGE 1, PAGE 2, and PAGE 3).
- Row 101:** Contains the text **SELECT (1) BACKGROUND STYLE (BELOW)** (under COVER) and a grid of boxes (under PAGE 1, PAGE 2, and PAGE 3).
- Row 109:** Contains three rows of boxes for **STYLE** (A, B, C) (under COVER) and a grid of boxes (under PAGE 1, PAGE 2, and PAGE 3).

The form is labeled 100. The grid is organized into four main columns: **COVER**, **PAGE 1**, **PAGE 2**, and **PAGE 3**. The rows are labeled with reference numerals: 68, 104, 107, 101, and 109.

FIG. 12

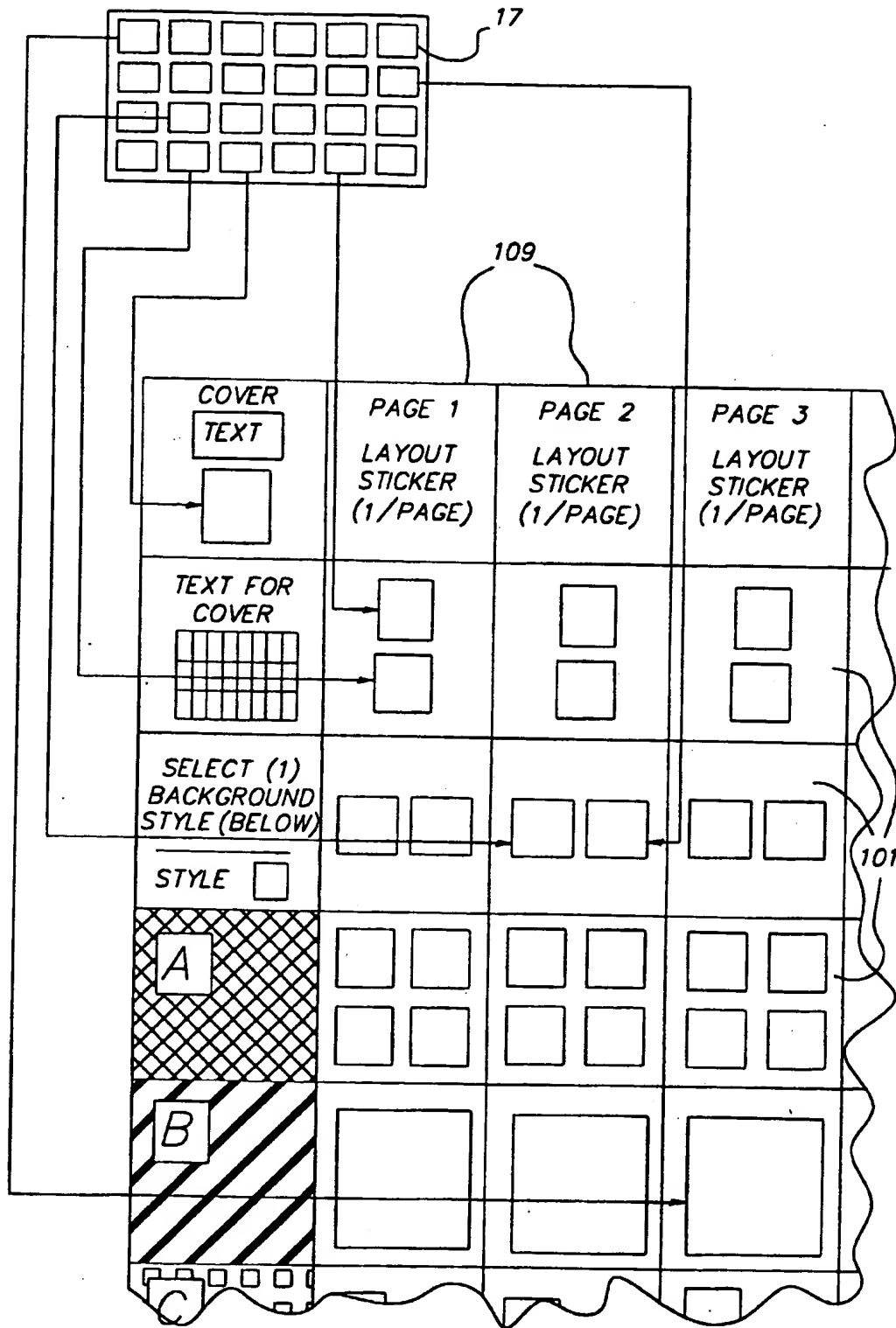


FIG. 13

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(54) **System and method of constructing a photo album**

(57) A method of constructing a photo album wherein a plurality of digital images are provided in a low resolution format as either thumbnail index sketches or sticker sheets that have a unique identifier that cross references the reduced resolution images digital images with a high resolution version that is stored in a data base. The thumbnail index sketches have a selection mechanism that allows the creation of photo albums by cross referencing the high resolution images that are stored in the data base. The embodiment that employs stickers has various mechanisms for creating the pages of a photo album including a second set of sticker sheets that function as pages of a photoalbum having positions for the low resolution image stickers. The sticker sheet pages can also be stickers themselves allowing for creation of photo albums by arranging the stickers pages are loaded with low resolution stickers creating the pages for the photoalbum and the sticker sheet pages are then arranged in a desired manner on a page layout form resulting in a miniature version of the photoalbum which can be viewed at that point. The miniature version of the photo album is then correlated to the high resolution version of the images

stored in the database to retrieve a high resolution version of the photo album which is then produced using conventional photofinishing techniques.

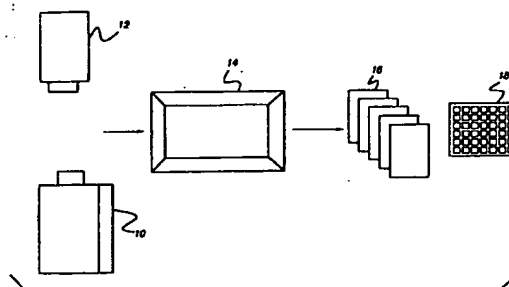


FIG. 1



European Patent  
Office

# EUROPEAN SEARCH REPORT

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The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 31 March 2000	Examiner Isa, S
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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**ANNEX TO THE EUROPEAN SEARCH REPORT  
ON EUROPEAN PATENT APPLICATION NO.**

EP 99 20 2275

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